the southern parts of Weddell Sea resembles that of the McMurdo Sound area in having a uniform winter temperature, instead of a sharp descent to a minimum. A steady Föhn effect of wide radius from the mountains of the Antarctic continent would explain this anomaly, as would also the incursion of relatively warm air from lower latitudes associated with incurved cyclonic N.E. winds in the eastern part of Weddell Sea. Dynamic heating in the *free air*, without the intervention of high land, is also within the bounds of possibility.

R. C. MOSSMAN.

NOTES.

WHILE the British Association has suspended its annual gatherings for the last two years, the Società italiana per il Progresso delle Scienze, the head offices of which are at 26 Via del Collegio Romano in Rome, sends us a very attractive programme of the tenth meeting, which is to be held in Pisa on October 16–19 under the presidency of Prof. Ferdinando Lori and the secretaryship of the indefatigable Prof. Vincenzo Reina. The success of the meetings at Rome in 1916 and at Milan and Turin in 1917 has convinced the council that it will be interpreting the wishes of the members in continuing even in war-time to maintain its activity in promoting the advancement of knowledge in the country. We notice that such subjects as mathematics, physics, chemistry, and aeronautics do not figure in the proceedings of the sections, which are to be devoted mainly to geological and mineralogical papers in Class A, biological and medical in Class B, and economical in Class C. It is the object of the meeting to pay a large amount of attention to the study of the mineral resources of Italy. At the same time the Italian Thalassographic Commission is organising a subsection of Class B on fisheries, and is presenting an annual report, while similar reports are being presented by the Glaciological Committee and the National Commission for the Development of Scientific and Industrial Progress. The Italian Association for the Study of Building Materials is to meet in Pisa at the time of the congress. The opening meeting of the scientific gathering is to be held on Wednesday, October 16, at 10 a.m., in the Aula Magna of the University, when an inaugural address will be given by Prof. Raffaello Nasini on "A Proposal for an Inventory of Italy's Mineral Wealth." In addition to the sectional meetings, nine general lectures have been arranged for the mornings of the subsequent days, while the sections will meet in the afternoons, and an excursion will take place on the Sunday.

THE recent flight from England to Egypt, made by two R.A.F. officers and two mechanics, is an excellent example of the possibilities of aircraft with regard to long cross-country flights, and shows in an unmistakable way that the commercial use of the aeroplane after the war could be very rapidly developed. If a flight of 2000 miles can be satisfactorily made without special preparation on an ordinary service machine, it is fairly obvious that there are practically no limits to the possibilities of commercial aviation when the whole attention of designers can be given to the subject, and when the excellent research facilities which we possess can be devoted to the elucidation of the new problems involved. The war has worked wonders in promoting the development of aeronautical engineering, and such feats as the above leave little doubt that one of the good after-effects of the war will be the immediate application of our greatly increased knowledge of aviation to the problems of international commerce. The question of long oversea flights is fraught with more difficulties than attend long flights overland, but there are many who think that a cross-Atlantic flight is already within the bounds of possibility. The future of the aeroplane is bright with promise, and the declaration of peace will doubtless inaugurate a new era in the annals of commercial transport.

MR. CHARLES HERBERT SCOTT, whose death is announced, was born in 1860 at Lincoln, and was a member of the Institution of Mechanical Engineers. He was an authority upon linoleum manufacturing machinery, and was the patentee of many of the machines used for this process.

WE regret to note that *Engineering* for August 16 announces the death of Mr. Daniel Makinson Fox in his eighty-ninth year. After a varied railway experience at home and abroad, Mr. Fox acted as principal engineer of the Sao Paulo Railway in Brazil. He was a member of the Institution of Civil Engineers, and read a paper in 1870 on the Sao Paulo Railway.

THE death of Mr. Bramah Joseph Diplock, announced in the *Engineer* for August 16, will be regretted by many who took an interest in his well-known invention, the pedrail. Although he had no early technical training, Mr. Diplock's insight into things mechanical was remarkable, and he held some 100 patents in connection with transport machinery.

THE Mary Kingsley medal of the Liverpool School of Tropical Medicine for research in tropical diseases has been awarded to Dr. Griffith Evans, the discoverer of the trypanosome of Surra, a disease of horses and camels of India, Burma, and the East. Dr. Evans, who was born in 1835, has been a member of the Veterinary Department of the Army, and made his discovery in 1880. He contributes on the occasion of the award of the medal an interesting autobiographical note to the *Annals of Tropical Medicine and Parasitology* for July (vol. xii., No. 1).

SOME additional information regarding the Hog Island shipyard has been obtained by Lloyd's Register of Shipping, and appears in an article in the *Engineer* for August 16. The methods adopted for training the men are of interest. No skilled labour could be obtained, and a school was started, which provides daily from 300 to 400 men for the yard. A section of a ship has been built, where men are taught riveting, caulking, erecting, bolting up, pipe fitting, and any trade necessary. It is marvellous to see how quickly and how well they learn. The first ship was launched on August 14, and when it is considered that not fewer than two-thirds of the men who have built her never saw a shipyard until about six months ago, it must be admitted to be a wonderful performance.

THE U.S. National Research Council, acting as the Department of Science and Research of the Council of National Defence, has appointed a committee to investigate the fatigue phenomena of metals. Prof. H. F. Moore, of the engineering experiment station of the University of Illinois, is chairman. The committee is charged with the responsibility of developing a knowledge of the strength and durability of metals subjected to repeated stresses, such as ship structures, crank-shafts of aircraft engines, and heavy ordnance. It is expected that much of the experimentation required will be done in the laboratories of the University of Illinois at Urbana under the personal direction of Prof. Moore.

The autumn meeting of the Iron and Steel Institute will be held at the Institution of Civil Engineers, Westminster, on Thursday and Friday, September 12 and 13. Among the papers that are expected to be submitted are:—The Rate of Change at 100° C. and at Ordinary Temperatures in the Electrical Resistance of Hardened Steel, E. D. Campbell; Some Experiments on the Reaction between Pure Carbon Monoxide and Pure Electrolytic Iron below the A_1 Inversion, H. C. H. Carpenter and C. Coldron Smith; Influences of Hot Working on the Qualities of Steel, G. Charpy; The Casting of Steel in Ingot and other Moulds, J. E. Fletcher; Magnetic Analysis as a Means of Studying the Structure of Iron Alloys, K. Honda; Standardisation of Tests for Refractory Materials, Cosmo Johns; The Utilisation of Waste Heat from Open-hearth Furnaces for the Generation of Steam, T. B. Mackenzie; and Influence of Elements on Tenacity of Basic Steel, A. McWilliam.

According to the June issue of *Terrestrial Magnetism and Atmospheric Electricity*, the magnetic survey ship *Carnegie* arrived safely at her home port in June last after having been detained for nine months last year at Buenos Aires owing to the methods of sea warfare adopted by our enemies. Her survey work is to be suspended until it can be resumed with safety. The results of the survey of the eastern portion of the Pacific between the middle of Chile and the Bay of Panama, which she was able to make during her journey home in the early months of the present year, are given in the same issue. The United States and British charts are in close agreement with the new measurements so far as the deviation of the compass is concerned, but both charts are seriously wrong in their values of the dip. Errors of three or four degrees are frequent, and errors of five degrees are occasionally present.

In a letter to the *Daily Telegraph* of August 13, Mr. F. W. Twort professor-superintendent of the Brown Institution, criticises the procedure of the War Office with reference to the epidemic of dysentery in the Salonika area during 1915 and 1916. Towards the end of 1915 Mr. Twort was appointed in charge of a laboratory at Salonika, and came to the conclusion that much bacillary dysentery occurred in the district. The War Office set up a Medical Advisory Committee for the Eastern area of operations, and this Committee in Egypt issued a report on Salonika. It apparently considered the dysentery of Salonika to be the amœbic form. In consequence of these findings, which he considered to be erroneous, Mr. Twort retired from the Army Medical Service. At the end of 1917 Lt.-Col. Buchanan, a member of the War Office Advisory Committee, admitted that the diagnosis of dysentery by this Committee was wrong; that bacillary dysentery occurred at Salonika; and that certain large cells in the mucus had been mistaken for amœbæ. In spite of these findings, the War Office, Mr. Twort asserts, has so far taken no action to put matters right so far as this is now possible.

The Rev. W. Lower Carter, who died on June 19, was from early youth an indefatigable worker in the interests of geology, but it was relatively late in life that he took up scientific work as a profession. He began business life as a bank clerk, and doubtless the experience he gained in that capacity developed the organising abilities for which Mr. Carter was justly known. After a successful university career at Birmingham, Cambridge, and Halle, he entered the Congregational ministry. What time he could spare from his pastoral work was devoted to stimulate and assist scientific research, particularly in connection with the Leeds Geological Association and the Yorkshire Geological and Polytechnic Society. For many years he edited the Transactions of these societies, and, as honorary secretary, organised their various activities. When, in 1908, Mr. Carter resigned his charge in Birkenhead to become lecturer in geology at East London College, and afterwards lecturer in geography at Queen's College, London, he still retained his interest in the Yorkshire societies, and it is largely due to his work that the Yorkshire Geological Society became so prominent among provincial societies. Further scope was afforded his powers of organisation when he acted for several years as recorder of Section C (Geology) of the British Association. The time and energy given to assist the spread of scientific knowledge through these bodies limited his original research work. This, chiefly in the form of short notes, was published in the Transactions of the Yorkshire societies, as also more important contributions on the development of certain river systems in Yorkshire. It is, however, as an organiser and teacher rather than as an investigator that Mr. Carter's name will be remembered among geologists.

The pleomorphism and developmental cycles of the bacteria is the subject of a paper by Dr. Sopp in *Naturen* (Bergen) for May (No. 5, 1918). In particular he reviews the work of Almquist on pleomorphism and that of Löhnis on the developmental cycle of Azotobacter, in which he claims that conjugation occurs with the formation of various spore-like bodies.

The July issue of the *Archives of Radiology and Electrotherapy* (vol. xxiii. No. 2) is devoted to the consideration of the treatment of paralysis due to nerve injury, a subject of great importance at the present time. The principal paper is contributed by Lieut. Noel Burke, R.A.M.C. He concludes that rational treatment of this form of paralysis must be directed to the nerve as well as to the muscle. It takes the form of the galvanic current with or without ionisation. Pain can usually be relieved by electrical means or by heat. The muscles should be treated both with massage and with the galvanic or sinusoidal current. A discussion of the paper followed, in which many speakers took part.

The *National Geographic Magazine* for May is devoted to a survey of the smaller North American mammals by Mr. Edward Nelson. This is a really wonderful achievement, for the author has contrived to crowd a vast amount of information concerning the chief characteristics, and habits, of a very remarkable series of animals into a surprisingly small space. Yet he seems to have omitted nothing material in his task of condensation. A comment of his on the brown rat in South Georgia is worth bearing in mind. This animal, he tells us, was introduced into the island from whaling ships, and now, owing to the abundant supply of food furnished by the great number of whale-carcasses which drift ashore each season, it may be found there in millions. Sooner or later this source of food will cease, and it will then go hard with the great colonies of penguins which still nest there unless means for the destruction of this pest are speedily devised. In addition to a large number of coloured plates of great beauty are numerous text-figures, illustrating the tracks made by various animals when walking and running.

The *Journal of Agricultural Research* (Washington) for June (vol. xiii., No 10) contains an account by Mr. R. W. Glaser of a new bacterial disease of gipsy-moth caterpillars. It was apparently introduced with some eggs of the Japanese gipsy moth, and the infection later spread to the American race. The disease manifests itself in the caterpillars, which suffer from diarrhœa, cease to eat, lose muscular co-ordination, and die. The microbe is a streptococcus and is conveyed by ingestion, and the muscular tissue of the insect is first attacked. The disease was introduced into woods heavily infested with the gipsy moth, and in two localities severe epidemics were produced. It is hoped that it may be of service in helping to combat the ravages of the gipsy moth. In another paper in the same journal Mr. J. Rosenbaum discusses the survival of the blackleg organism of the potato in the soil during winter. The organism (*Bacillus phytophthorus*) does not seem to be able to survive in the soil or in diseased tubers that may remain there under winter conditions.

The Kew Bulletin, we are glad to notice, is being published this year with regularity, and five numbers have already appeared. In No. 5 there is a valuable article on the preservation of wood by the application of chemicals, which plays so important a part in timber economy. The chief value of preservatives is to render the wood less susceptible to the attacks of parasitic fungi, to make it waterproof and less inflammable, and to prevent the attacks of boring insects. A general account of the subject is given, and then attention is directed in detail to the important book on the subject recently published by Mr. A. J. Wallis-Tayler. The various chapters of the book are reviewed, and this is followed by a bibliography of works upon other definite branches of wood preservation, such as wood pavement, creosoting railway sleepers, etc. A number of the works cited have been published in the United States and some from India, while others dealing with the treatment of timber for estate purposes have been published in the *Quarterly Journal of Forestry*.

The Journal of the Royal Agricultural Society (vol. lxxviii.) contains two papers relating to milk production and distribution which are of interest to a far wider circle of readers than the members of the society. Mr. James Mackintosh, adviser in dairying to University College, Reading, discusses the effect of the new agricultural policy on the dairy-farming industry. The increase in arable area at the expense of the grass area is thought by many dairy-farmers to necessitate a reduction of herds, but although Mr. Mackintosh declines to accept this conclusion, and offers evidence that more food for cows can be produced when a certain amount of grassland is broken up, he anticipates that the higher cost of production and the greater labour involved in arable dairying as contrasted with other systems of farming, which may in the future be equally remunerative, may lead to a decline in milk-production in districts best adapted for corn-growing, such as the Eastern Counties, and hence possibly to difficulties of supply in these areas. In the West a decline is less to be feared if the prices of milk and milk products allow of reasonable profit, and adequate means of education are provided. In a paper on the wastage of milk Dr. R. Stenhouse Williams gives some striking figures as to the extent to which milk is at present lost by souring, splashing, and in other ways, and indicates the lines along which a rational system of production and distribution of clean milk might be organised.

The unknown Belcher Islands, in the south-east of Hudson Bay, were explored in 1914 and 1915 by Mr. R. J. Flaherty, who for the last six years has been examining the Hudson Bay region, the Ungava Peninsula, and Baffin Land for iron-ore and other mineral deposits. Mr. Flaherty has an article on the islands in the June number of the *Geographical Review* (vol. v., No. 6). The article contains several illustrations and the first map of the islands to be published. Previously they were represented on charts by dotted outlines of incorrect shape and position. It appears that the Belcher Islands consist of several long, narrow islands extending north and south for ninety-one miles, with an extreme width of fifty-seven miles. Their area is more than 5000 square miles. The islands are low, rising barely to 500 ft. at most, and studded with lakes well supplied with salmon and other fish. Harbours are numerous. Vegetation is scanty, and there are no trees, but animal life is abundant. A tribe of Eskimos, consisting of only five families, permanently inhabit the islands. Other Eskimo from time to time migrate from the mainland in search of walrus, sea-fowl, and, before their disappearance, caribou. Mr. Flaherty reports large deposits of iron-ore, not, however, of high quality. It is remarkable that such a large and not unimportant group of islands, comparatively near to civilisation and easy of access. should have remained so long unexplored.

Kisskalt's view that the action of the sand filter in water purification is biological and due to the destruction of bacteria by other organisms is contested as the result of experience at the Zürich waterworks, where the lake-water is filtered in two stages through sand. According to L. Minder (*Journal für Gasbeleuchtung und Wasserversorgung*, No. 61, 1918), the first layer retains most of the fresh-water planktons, but allows some of the bacteria to pass. The bacteria are retained by the second filter and at the surface, so that at a depth of 10 cm. the number per cubic centimetre has already fallen to one-tenth. Furthermore, the retention of bacteria is satisfactory even when there are considerable fluctuations in the number of bacteria in the water. Thus it is concluded that the process is mechanical rather than biological.

According to the *Annali d'Ingegneria e d'Architettura* for June 16, a strong committee of business men has been formed to consider the possibility of constructing, after the war, a canal connecting Milan with Lake Como, and joining the important waterway which it is proposed to make from Milan to Venice, thus opening up the rich plains of Lombardy to cheap means of transit. The works involved would comprise a canal from Milan to Vimercate, a vast tunnel from Vimercate to the River Adda, and the canalisation of the Adda from Paderno to Lecco. The scheme has the approval of the city of Milan, and will be supported by the Edison Company, which is the chief user of the waters of the Adda. Some of the features of the new undertaking are discussed, and the advantages which the new canal would confer on Milan are explained. The distance by water from Milan to Lake Como would be reduced by about eleven miles.

In a paper on the limit of sensibility of the eye and the minimum of power visually perceptible, which appears in the March–April issue of the *Journal de Physique*, M. Buisson claims that the eye is much more sensitive than it has been thought to be. A number of discs of diameters from 2·5 to 5 millimetres were covered with phosphorescent material, and the light sent out by them determined by the Fabry-Buisson micro-photometer to be between two and four candles per square centimetre. Two of these discs of the same size and strength were mounted on a screen, which was gradually removed from the observer and at the same time rotated about his line of sight, and he was required to state the direction the line joining the two discs made with the horizontal until with increase of distance it became impossible. For discs of different diameters and strengths the limit of perception was found in all cases such that if there were no absorption of light by the atmosphere a candle would be visible at a distance of 27 kilometres. This is equivalent to a star of the eighth magnitude, and it is probably the light of the sky which prevents stars of higher magnitude than the sixth being visible.

Engineering for August 9 has an illustrated article descriptive of an electrically welded barge, which has been built at a yard on the south-east coast under Government control. This barge is 120 ft. long and 16 ft. beam, and has a displacement of 275 tons. The vessel, with full cargo, has been at sea during exceptionally rough weather, and answered satisfactorily in every way to the test imposed. No rivets were used in the construction, the whole of the structure being put together by electric welding. The adoption of this system was a direct consequence of experience in welding by means of the flux-coated metal electrode process at the Admiralty dockyards. There are seventy-one transverse frames in the barge, with three bulkheads; plates of thicknesses $\frac{1}{4}$ in. and $\frac{5}{16}$ in. were used for the shell plating. It is estimated that future vessels of this size should be built with a saving of 25 to 40 per cent. of time and about 10 per cent. of material as compared with ordinary riveted barges. The United States Shipping Board is making arrangements for the building of a number of 10,000-ton standard ships in which the use of rivets will be reduced to about 2·5 per cent. of the normal number.

THE problem of ascertaining the distribution and magnitudes of the stresses in a revolving disc by means of mathematical formulæ is tedious and complicated. With the exception of the cases of discs of constant thickness and constant strength, for which definite integrals can be found, the analytical solution involves highly complex equations, and the ultimate result is doubtful. In the course of an article in *Engineering* for August 9, Mr. H. Haerle describes a method which can be applied to any sectional profile and reduces the mathematical work to a minimum, while at the same time results are obtained which are sufficiently accurate for all practical purposes. The general formulæ are given by Dr. Stodola in his book on steam turbines, and from these other expressions are deduced for the sum and difference of the principal stresses. Mr. Haerle has prepared a chart showing the relation of these sums and differences with tangential velocities, and shows how the chart may be applied to the solution of discs of uniform thickness with and without a central hole, discs of hyperbolic profile, and turbine discs having the tapered sides usually employed in practice. An example of an impeller disc for a turbo-compressor is also worked out. Mr. Haerle's method gives remarkable agreement with the mathematical method, and certainly simplifies greatly an exceedingly complicated problem.

MRS. M. T. ELLIS contributes to the June issue of the *Biochemical Journal* three interesting papers on the plant sterols. In the first is recorded the failure to isolate a typical phytosterol from the vegetative organs of the cabbage plant or from the fæces of rabbits fed on a cabbage diet, although from the latter source a small quantity of a substance giving the cholesterol colour reactions was separated. On the other hand, cabbage-seeds contain a relatively large amount of crystalline matter apparently similar to the mixture of phytosterols present in rape-oil, which is interesting in view of the fact that both rape and cabbage belong to the genus Brassica. Grass-fruits also contain phytosterol, but a larger amount of chortosterol. The second paper deals with the sterol content of wheat, and it was found that the chief phytosterol present both in the grain and in the embryo is sitosterol. The bran contains a phytosterol, but one different from sitosterol. A method of estimating phytosterol was devised based on the insolubility of the compound of this substance with digitonin. The quantity of phytosterol in the etiolated wheat-plant is approximately the same as in the grain, but it is higher in the adult plant. In the embryo the percentage of phytosterol is much higher than in the plant, thus suggesting an essential function in germination and growth. In the third paper ("The Occurrence of Phytosterol in some of the Lower Plants") it is shown that a mixture of ergosterol and fongisterol, previously known to occur in fungi, is present in *Polyporus nigricans*, and probably also in *P. betulinus*. From the alga Laminaria, the Musci Sphagnum, and the fungi *Agaricus rubescens* and *Lactarius subdulcis* oils were obtained which gave the cholesterol colour reactions.

MESSRS. BUTTERWORTH AND CO. (INDIA), LTD. (Calcutta), have sent us a copy of their Medical Catalogue for 1918. It is a very comprehensive list of works published in Great Britain, India, and America on medicine, surgery, dentistry, obstetrics, pharmacy, ophthalmology, and the allied sciences. As it is carefully arranged according to subjects, and the prices are given in Indian currency, it should be very useful to medical men resident in India and the Far East, to whom it will be sent free by the publishers upon application.

MESSRS. T. C. AND E. C. JACK, LTD., announce two forthcoming books by F. Martin Duncan, viz. "Wonders of the Seashore" and "How Animals Work." They also promise "Water in Nature," by W. Coles Finch and Ellison Hawks.

THE Oxford University Press is about to begin the publication of "Neurological Studies," from the Seale Hayne Military Hospital, Newton Abbot. It will be edited by Major A. F. Hurst, with assistance.

OUR ASTRONOMICAL COLUMN.

WOLF'S PERIODIC COMET.—Mr. M. Kamensky has further revised his orbit of this comet, applying perturbations by the earth, Mars, Jupiter, and Saturn. His elements are given in *Ast. Journ.*, No. 738:—

$$\begin{aligned} T &= 1918 \text{ Dec. } 13{\cdot}3909 \text{ G.M.T.} \\ \left.\begin{aligned} \omega &= 172^\circ\ 54'\ 41{\cdot}83'' \\ \Omega &= 206^\circ\ 41'\ 31{\cdot}71'' \\ i &= 25^\circ\ 17'\ 31{\cdot}54'' \end{aligned}\right\} & 1918{\cdot}0 \\ \phi &= 33^\circ\ 58'\ 31{\cdot}85'' \\ \mu &= 522{\cdot}42893'' \end{aligned}$$

The Greenwich observations in July indicate the very small correction +0·0046d. to the value of T.

Ephemeris for Greenwich Midnight

	R.A.			N. Decl.	
	h.	m.	s.	°	′
Sept. 3	20	0	38	22	20
7	20	0	17	21	13
11	20	0	36	20	0
15	20	1	36	18	43
19	20	3	17	17	23
23	20	5	39	16	1
27	20	8	44	14	37
Oct. 1	20	12	31	13	12

Values of log r, log Δ: September 3, 0·2726, 0·0274; October 1, 0·2415, 0·0242 respectively.

The comet is nearest to the earth on September 20, and the theoretical brightness is greatest on October 12.